IN THE CLAIMS:

Please amend Claims 48, and 50-59 as follows:

48. The image processing device of [claim 46 or claim 47] claim 46 wherein said Enlarging Object Images means comprising:

Edge generating means for generating edge images – in a plurality of specific directions – of an image regulated by said Inputted Images regulating means, and

Leveling up means for generating an image having four times as many picture elements by regarding said respective edge images and said regulated original image as sub-band components in Wavelet transform and by performing inverse Wavelet transform on said sub-band components.

50. The image processing device of [claim 46 or claim 47] claim 46 wherein said Enlarging Object Images initializing means comprising:

Input fine-adjustment means for re-regulating the numbers of the picture elements of said regulated original image in the horizontal direction and the vertical direction to multiples of 2,

Leveling down means for generating a transformed image by performing Wavelet transform on said re-regulated original image,

Reference Components generating means for generating edge images – in a plurality of said specific directions – from a plurality of sub-band components situated in the of said transformed image,

Correction estimating means for finding the relation between said respective edge images and the sub-band components belonging to the low frequency [space] area corresponding to said specific directions of said transformed images,

Edge generating means for generating edge image – in plurality of specific direction – of image re-regulated be said Input fine-adjustment means,

Component estimating means for estimating the respective sub-band components in Wavelet transform by correcting said respective edge image of re-regulated original image according to the results of said correction estimating means, and

Leveling up means for generating an enlarged image having four times as many picture elements by performing inverse Wavelet transform on said respective sub-band components and said re-regulated original image.

51. The image processing device of claim 50 wherein Reference Components generating means finds said edge image by Laplacian filter from the sub-band components situated in the low frequency area of said transformed image.

52. [The image processing device of claim 46 or claim 47 wherein in case said Ln/2 picture elements and Lm/2 picture elements are integers, an inputted original image is regulated by said Inputted Images regulating means, and from the regulated image, said Enlarging Object Images means generates an enlarged image, and wherein in case at least one of Ln/2 picture elements and Lm/2 picture elements is not an integer, the inputted original image is regulated by said Inputted Images regulating means , and from the regulated image, said Enlarging Object Images means generates an enlarged image, and then the enlarged image obtained by Enlarging Object Images means is regulated to Ln picture elements x Lm picture elements by means for regulating enlarged image] The image processing device of claim 50 wherein Reference Components generating means finds said edge extraction filters corresponding to respective direction from the sub-band components situated in the low frequency area of said transformed image.

53. [An image processing device for acquiring an enlarged image of Ln picture elements x Lm picture elements by enlarging a color image of n picture elements x m picture elements, said device comprising:

Standard Component selecting means for selecting a standard color component from among the components making up said color image,

Transform Ratio deriving means for deriving the transform ratio which is used when deriving the other color components from the standard color selected by said Standard Component selecting means.

Standard Component Image regulating means for regulating the standard color component of the inputted original image to Ln/2 picture elements x Lm/2 picture elements,

Standard Image enlarging means for generating a standard enlarged image by applying a method based on Wavelet transform to said regulated standard color component,

Standard Enlarged Image regulating means for regulating said standard enlarged image to a desired size Ln picture elements x Lm picture elements,

Shortage Component enlarging means for estimating the enlarged images of the other color components by applying said transform ratio to said regulated standard enlarged image, and

Enlarged Color Image recomposing means for generating said enlarged image by synthesizing said standard enlarged image and said enlarged images of the other color components] The image processing device of claim 46 wherein in case said Ln/2 picture elements and Lm/2 picture elements are integers, an inputted original image is regulated by said Inputted Images regulating means, and from the regulated image, said Enlarging Object Images means generates an enlarged image, and wherein in case at least one of Ln/2 picture elements and Lm/2 picture elements is not an integer, these numbers are changed so that both may become integer, the inputted original image is regulated at the image composed of these numbers of picture elements by said Inputted Images regulating means, and from the regulated image, said Enlarging Object Images means generates an enlarged image, and then the enlarged image obtained by Enlarging Object Images means is regulated to Ln picture elements x Lm picture elements by Enlarged Image regulating means.

54. The image processing device of claim 50 wherein said correction estimating means finds the difference image – as respective correction component image – between the edge images in said respective directions and the sub-band components belonging to the low frequency area corresponding to said specific directions of said transformed images, and wherein said component estimating means enlarges said respective correction component images to images with four times as many picture elements by liner interpolation, and adds the corresponding edge images to said correction component images.

55. An image processing [method] device for acquiring an enlarged image of Ln picture elements x Lm picture elements by enlarging [an original image] a color image of n picture elements x m picture elements, [said method comprising the steps of:

inputted image regulating for regulating said original image to Ln/2 picture elements x Lm/2 picture elements, and

image enlargement for generating an enlarged image by applying an enlargement method based on Wavelet transform to the image regulated by Inputted Images regulating means] said device comprising:

Standard Component selecting means for selecting a standard color component from among the components making up said color image,

Transform Ratio deriving means for deriving the transform ratio which is used when deriving the other color components from the standard color selected by said Standard Component selecting means,

Standard Component Image regulating means for regulating the standard color component of the inputted original image to Ln/2 picture elements x Lm/2 picture elements,

Standard Image enlarging means for generating a standard enlarged image by applying a method based on Wavelet transform to said regulated standard color component,

Standard Enlarged Image regulating means for regulating said standard enlarged image to a desired size Ln picture elements x Lm pictures elements,

Shortage Component enlarging means for estimating the enlarged images of the other color components by applying said transform ratio to said regulated standard enlarged image, and

Enlarged Color Image recomposing means for generating said enlarged image by synthesizing said standard enlarged image and said enlarged images of the other color components.

56. An image processing method for acquiring an enlarged image of Ln picture elements x Lm picture elements by enlarging an original image[, said method comprising the steps of:

enlargement initializing for initializing the enlargement process by setting the original image as enlargement object image,

object image enlarging for generating an enlarged image having four times as many picture elements by applying an enlargement method based on Wavelet transform to said enlargement object image,

multiple proceeding end judging for setting – as enlargement object image – the enlarged image obtained by said Enlarging Object Images means and returns the process to said Enlarging Object Images means

enlarged image presenting for visually presenting the enlarged image obtained by said Enlarging Object Images means,

image regulating for enlarging or reducing the enlarged image presented by said Enlarging Object Images means, and

enlarged image outputting for outputting the image obtained from said image fine-adjustment means] of n picture elements x m picture elements, said method comprising the steps of:

inputted image regulating for regulating said original image Ln/2 picture elements x Lm/2 picture elements, and

image enlargement for generating an enlarged image by applying an enlargement method based on Wavelet transform to the image regulated by Inputted Images regulating means.

57. [A recorded medium on which a program is recorded, said program – when acquiring an enlarged image of Ln picture elements x Lm picture elements by enlarging a color image of n picture elements x m picture elements – regulating said original image to Ln/2 picture elements x Lm/2 picture elements, and applying an enlargement method based on Wavelet transform to the regulated image, thereby generating an enlarged image]An image processing method for acquiring an enlarged image by enlarging an original image, said method comprising the steps of :

enlargement initializing for initializing the enlargement process by setting the original image as enlargement object image,

object image enlarging for generating an enlarged image having four times as many picture elements by applying an enlargement method based on Wavelet transform to said enlargement object image,

multiple proceeding end judging for setting- as enlargement object image-the enlarged image obtained by said Enlarging Object Images means and returns the process to said Enlarging Object Images means,

image regulating for enlarging or reducing the enlarged image presented by said Enlarging Object Images means, and

enlarged image outputting for outputting the image obtained from said image fine-adjustment means.

58. A recorded medium on which a program is recorded, said program – when acquiring an enlarged image of Ln picture elements x Lm picture elements [by regulating an original image – setting the original image as enlargement object image, and generating an enlarged image having four times as many picture elements by applying an enlargement method based on Wavelet transform to said enlargement object image, setting the enlarged image as enlargement object image and returning the process to Enlarging Object Images means and at the same time visually presenting the enlarged image, thereby enlarging or reducing said enlarged image] by enlarging a color image of n picture elements x m picture elements- regulating said original image Ln/2 picture elements x Lm/2 picture elements, and applying an enlargement method based on Wavelet transform to the regulated image, thereby generating an enlarged image.

Please add new claims 59-62 as follows:

59. A recorded medium on which a program is recorded, said program-when acquiring an enlarged image by regulating an original image- setting the original image as enlargement object image, and generating an enlarged image having four times as many picture elements by applying an enlargement method based on Wavelet transform to said enlargement object image, setting the enlarged image as enlargement object image and returning the process to Enlarging Object Images means and at the same time visually presenting the enlarged image, thereby enlarging or reducing said enlarged image.

60. The image processing device of claim 46 wherein said Enlarging Object Images means comprising:

Edge generating means for generating edge images – in a plurality of specific directions – of an image regulated by said Inputted Images regulating means, and

Leveling up means for generating an image having four times as many picture elements by regarding said respective edge images and said regulated original image as sub-band components in Wavelet transform and by performing inverse Wavelet transform on said sub-band components.

61. The image processing device of claim 46 wherein said Enlarging Object Images initializing means comprising:

Input fine-adjustment means for re-regulating the numbers of the picture elements of said regulated original image in the horizontal direction and the vertical direction to multiples of 2,

Leveling down means for generating a transformed image by performing Wavelet transform on said re-regulated original image,

Reference Components generating means for generating edge images – in a plurality of said specific directions – from a plurality of sub-band components situated in the of said transformed image,

Correction estimating means for finding the relation between said respective edge images and the sub-band components belonging to the low frequency [space] area corresponding to said specific directions of said transformed images,

Edge generating means for generating edge image – in plurality of specific direction – of image re-regulated be said Input fine-adjustment means,

Component estimating means for estimating the respective sub-band components in Wavelet transform by correcting said respective edge image of re-regulated original image according to the results of said correction estimating means, and

Leveling up means for generating an enlarged image having four times as many picture elements by performing inverse Wavelet transform on said respective sub-band components and said re-regulated original image.

62.[The image processing device of claim 46 or claim 47 wherein in case said Ln/2 picture elements and Lm/2 picture elements are integers, an inputted original image is regulated by said Inputted Images regulating means, and from the regulated image, said Enlarging Object Images means generates an enlarged image, and wherein in case at least one of Ln/2 picture elements and Lm/2 picture elements is not an integer, the inputted original image is regulated by said Inputted Images regulating means, and from the regulated image, said Enlarging Object Images means generates an enlarged image, and then the enlarged image obtained by Enlarging Object Images means is regulated to Ln picture elements x Lm picture elements by means for regulating enlarged image] The image processing device of claim 50 wherein Reference Components generating means finds said edge extraction filters corresponding to respective direction from the sub-band components situated in the low frequency area of said transformed image.

The Amendments to Pages 2,11,and 24, and Claims 48, 50-58 are attached in Appendix A.

REMARKS

Entry of this preliminary amendment is respectfully requested.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

Stephen A. Becker
Registration No. 26,527

600 13th Street, N.W.
Washington, DC 20005-3096
(202) 756-8000 SAB:ykg
Date: September 13, 2001
Facsimile: (202) 756-8087